Convert Test Score Image to Text And Update Automatically

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Chapter 1

Introduction

1.1 The Problem:

Among the many challenges that a teacher or a faculty has to go through the most challenging one is updating marks manually on a sheet by checking hundred of copies seem to be tedious and time consuming job for teachers.Especially requires a lot of effort if a faculty is teaching many sections consisting of many students. It has scope of making mistakes in coping the marks of the students. Some may get missed and some may be exchanged with other student's marks. So, this is quite a time consuming work. Therefore, would it not be amazing if we could somehow automate the task or process?

1.2 Why is this an important problem

Save time and effort for school/university teachers and faculties by scanning images and storing the respective marks of student in an excel sheet automatically without making such efforts. As well as less scope of making any errors by using this.Therefore it is limited to only educational institutions and is very

useful and user friendly.

1.3 Methodology

- Log In and Register Function will be created in Android studio and for backend Firebase will be used.
- The Text Detection from image will be done using Firebase Machine Learning Kit.
- To write the extracted text to a .xls or an excel sheet the Apache POI Library will be used

1.4 Planning

- Determining the problem.
- Finding ways to solve the problem.
- Learning new frameworks.
- Specifications.
- Selecting appropriate tools.
- Designing the UI.
- Coding and Debugging.
- Testing the project.
- Maintenance and Future works.

Figure 1.1: Gantt-chart

1.5 Contribution of each members

1. Sadia Sabrina Prome - UI design
2. Fahid Shadman Karim - Software build up
3. Md. Abdullah Al Mahfuz - Debugging and software development
4. Shapla Akter - Testing
5. Shakhawat Hosen - Report Writing

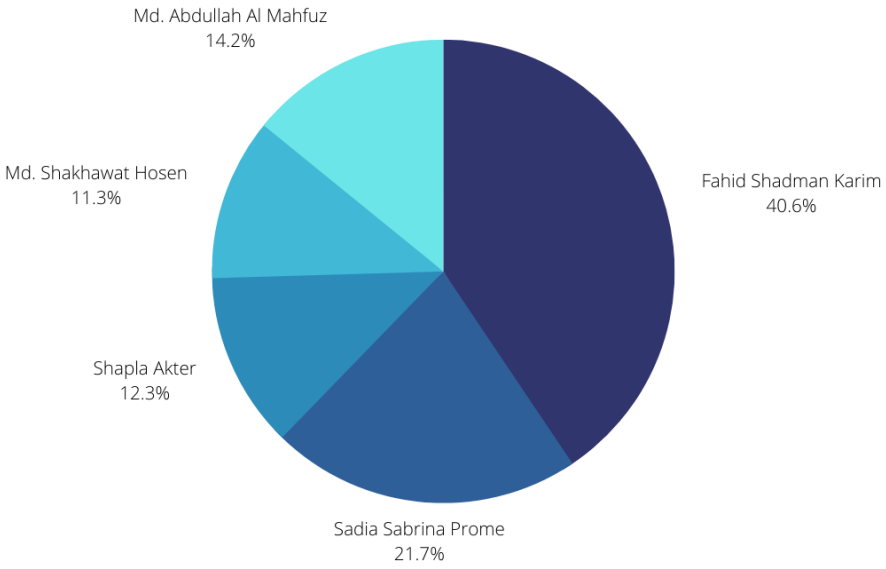

Figure 1.2: pie-chart of contribution of each members

Chapter 2

Project Specification

2.1 Functionalities

1. **Log In**
    - Every user is unique.
    - Users can log in into the application using their respective Google Account Credentials.
2. **Capture Image**
    - Users will be able to capture image using their phone camera.
    - Users can use both their front and rear camera to capture image.
3. **Detect Text**
    - Users will be able to extract the text from the captured image.
4. **Provide Excel Sheet and Column Names**
    - Users will be able to provide a file name for the excel sheet a to which the text will be written and also the column names

5. **Write to Excel Sheet**

    - Users will be able to write the extracted text from the image to the respective Excel Sheet.

6. **Log Out**

    - Users will be able to Log out of the Application.

Chapter 3

Software Design

The Application will capture image using a camera.Then convert the text using Machine learning language, the user will choose in what order the data set will be uploaded to the excel sheet.For that a text field will be given to the user along with another text field for the excel file name where the user wants to save the data set. And two button for to separate if to detect text or to write the data if the API did not worked properly for more freedom to the user and a safety space to fix the part the writing that did not covert to text. And all this will be designed by using singleton pattern. Here is the UI design for the App:

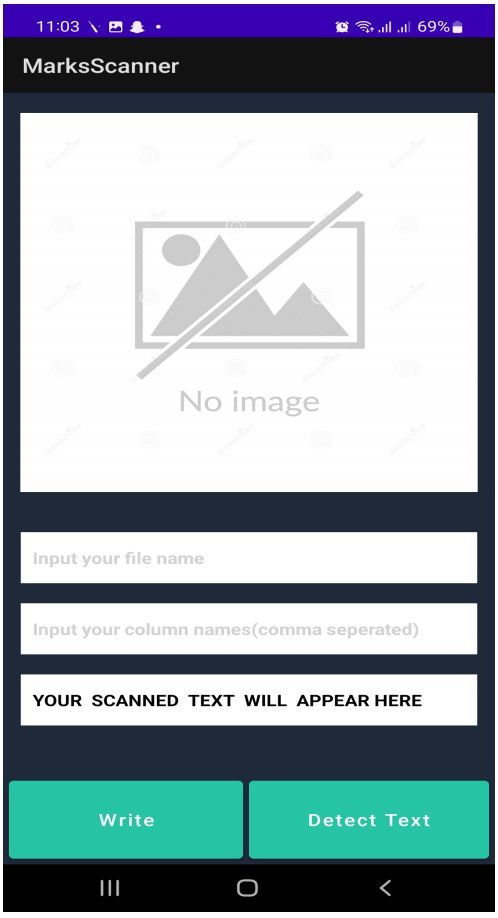

Figure 3.1: UI Design

Chapter 4

Software Implementation:

For extracting the text from the respective image we have used the FireBase Machine Learning Kit which is a general Purpose API and is also suitable for recognizing the text of documents. In order to use the Machine Learning Kit we had to connect our app to FireBase with our Google Account.This was done directly from Android Studio.

To enable the permission to use camera on any particular device user-permission was asked before allowing the used to take a picture.To recognize the text in the image a "Firebase Vision Image' object was created from a Bitmap.A Bitmap is a digital image composed of matrix of dots. After extracting the image, it was displayed in an EditText(Text Field) for allowing the user to edit and correct the text in case of inaccurate text detection

Figure 4.1: Sample Image

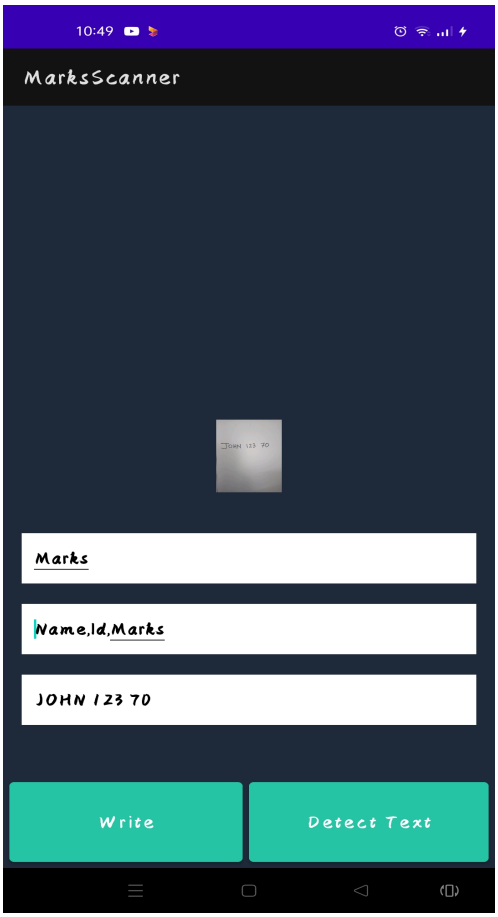

Figure 4.2: File Name and Column Name Input From user

The file name,column name (taken as input from the user) and the extracted text was inserted into a List of String. Finally for file creation and file writing purpose we used the Apache POI Library. To create a file according the users input a new file object was created and the respective file name was passed as a parameter.Finally to write to each individual cell sequentially the ".setCell-Value(Extracted Text)"method was used.

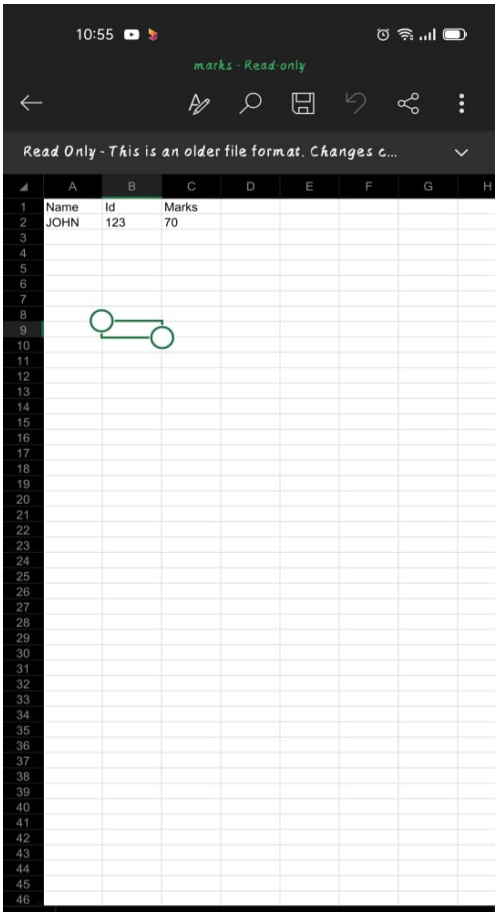

Figure 4.3: Updated Sheet

Chapter 5

Software Testing

Software testing is a method of determining whether the actual software product meets the expected requirements and ensuring that the software product is free of defects. It entails running software/system components through their paces using manual or automated tools to evaluate one or more properties of interest. The goal of our software testing is to find errors, gaps, or missing requirements in comparison to the actual requirements.

5.1 Type of testing

The testings has done by using multiple type of writing style, different colour, different spacing and in different shade of brightness.

5.2 Application Overview

The Application runs smoothly with no delay and contains all necessary functionality for expected outcome.

5.3 Image Capture

The Image Capture seems to have to error due to API limitation. The app sometimes give wrong result when the writing is curved style or anything that does not clearly defined letters. For that a new option has been created to give user option to edit the text generated by API.

5.4 Upload to Excel

When comes to Upload The data set to excel by user choice, it seems the data set upload properly and there are no error(s).

5.5 Security

The data set that generated by API, used immediately to upload to excel sheet so there no data loss or possibility of theft of the data set

Chapter 6

Maintenance and Future Planning

In the long term we would like to expand its usage to not only educational institutes but also for official or personal usage. E.g keeping a track of monthly expenses by scanning image of receipts. It will be agile and can be updated from time to time. It can be easily extended according to the need. We would like to incorporate Machine Learning in the future to get the academic progress of every student which would be very fruitful as students get to know about the progress he/she can take proper steps and preparation to cope up with the situation beforehand its too late. A major problem an instructor experiences is the systematic monitoring of students' academic progress in a course. The moment the students, with unsatisfactory academic progress, are identified the instructor can take measures to offer additional support to the struggling students.

Chapter 7

Conclusion

This App is designed to capture image then convert into text and then upload to a sheet. After considering the key functionality of the app the log in and log out part of the app seem redundant, so these sections of initial plan was dropped. Due to financial strain, the API that connects the data set to excel sheet has been changed to save the data set in local device. Thus the data transfer changed from online to offline.